SOLAR *for all* CALIFORNIA

DEPARTMENT OF COMMUNITY SERVICES AND DEVELOPMENT

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1 *Solar Means Sun!*

Have you ever sat down on a park bench warm from the sun?
Walked barefoot on a hot sidewalk?
Hung your laundry on a clothesline and let it dry?
Planted a garden and watched it grow?

If you've done any of these things, then you already know something about solar energy. The simplest definition of energy is that Energy makes something happen (warm us up, dry our laundry, make plants grow).

The new solar system on your roof (or coming soon) will also make something happen: it will turn sunshine into electricity and lower your electric bill!

DID YOU KNOW?

You may already have a PV system at your house. The smallest systems power calculators and wrist watches, highway signs and more.

2 *What is Photovoltaic?*

The word Photovoltaic (or PV) means "light-electricity".

PHOTO + VOLTAIC

"Photo" is a Greek word and means "light".

Think: *Photography*

"Voltaic" comes from a person's name: *Alessandro Volta.*

He lived in Italy from 1745 – 1827 and was a pioneer in the study of electricity.

Think: *Voltage*

3 Benefits *(to you, your neighborhood and the world)*

How your new PV system helps…

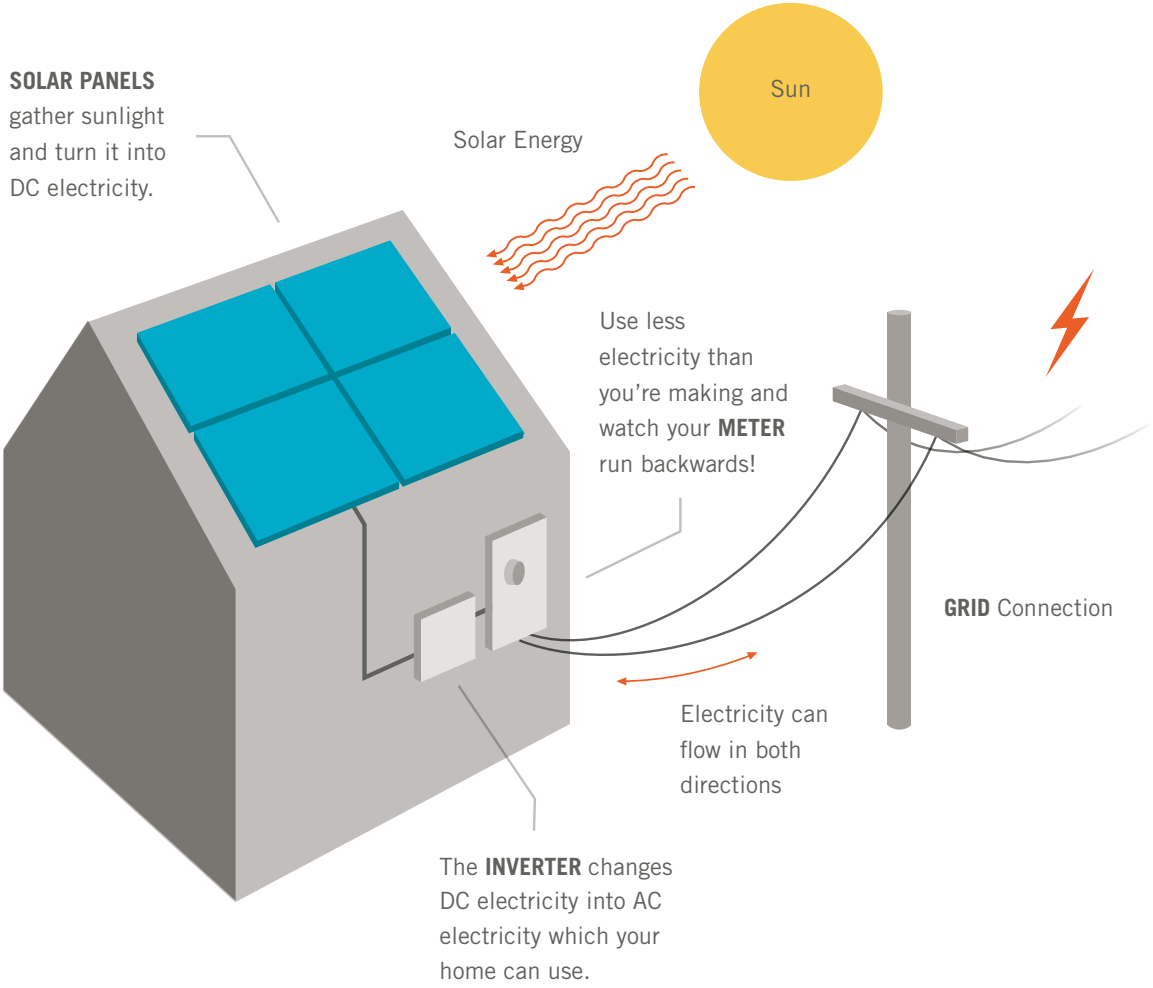
YOU AND YOUR FAMILY

- It won't cost you anything to install or maintain. The systems are being paid for by government grants and subsidies.
- Unless you increase your electricity use or electric rates go up, your monthly electric bill will be lower with PV than it is now. And it could be a lot lower.
- It has no moving parts and requires little to no maintenance.
- PV systems typically have a very long life. Many systems installed in the 1970's are still working and generating electricity today.
- It doesn't make noise.
- It doesn't pollute.

YOUR NEIGHBORHOOD AND THE WORLD

- The energy is free, clean and highly reliable.
- It reduces our community's dependence on oil.
- It creates local jobs and strengthens the economy.
- It produces no air pollution.

The solar system on your roof is called a “Photovoltaic” system (or PV, for short). Your Photo-Voltaic system is gathering sunlight and turning it into electricity.



4 *Parts of the PV System*

Your PV system is made up of a few main parts:

SOLAR PANELS (sometimes called modules) – Solar panels are the individual rectangles you may have seen mounted on rooftops. They appear black or dark blue and are covered with glass.

These panels contain thin sheets of the key ingredient, silicon, which allows sunlight to be turned into electricity. If you want to learn more about the science of solar, there is a lot of information available on the Internet or at the library.

Panels come in different sizes and are connected to form an "array." This solar array collects sunlight and turns it into electricity.

INVERTER – The electricity produced by solar panels is called DC (or Direct Current). The electricity your home uses is called AC (or Alternating Current). The inverter changes DC electricity into AC so it can be used in your home to power everything from lamps to televisions.

In most cases, the inverter is a box mounted on the outside of your house, probably near your existing electrical panel.

Some PV systems now have inverters built right into the solar panels. If you receive this type of system, you won't see an inverter box.

METER – You'll have a "bi-directional" meter with solar. Bi-directional means that the meter can run in two directions: forwards and backwards. When your PV system produces more electricity than your home needs, the meter will run backwards.

If the meter on your home is already bi-directional, your existing meter will be used. If it's not, a bi-directional will be installed to track your energy production.

THE GRID – the whole PV system is connected to your electric company, or what's often called the Grid.

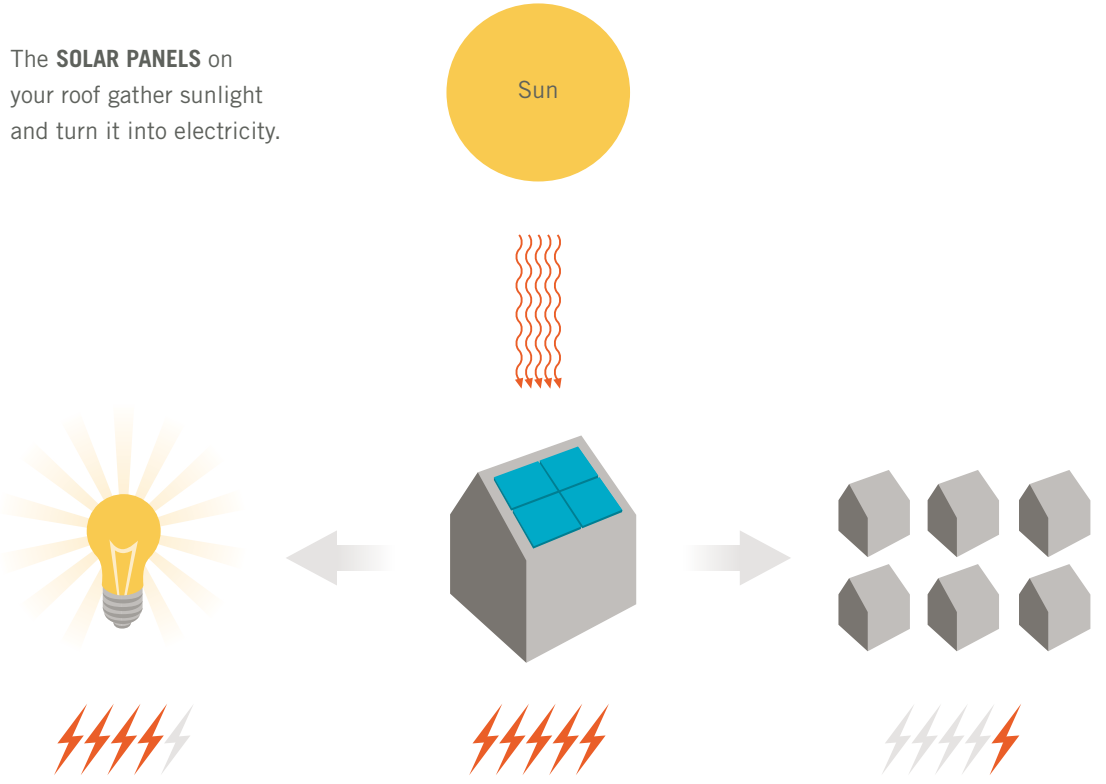
The electric grid (The Grid) is made up of power lines that criss-cross the country, connecting the power plants that make electricity to the homes and businesses that need electricity. One of those power lines ends up at your house, giving you electricity you need to watch TV and do laundry and turn on the lights.

With your new PV system, your home will become part of that grid. Your house will be like a tiny power plant, making electricity and feeding it into the grid when you make more than you need.

DID YOU KNOW?

The amount of sunlight that hits the Earth's surface in one hour is enough to power the entire world for a year.

The **SOLAR PANELS** on your roof gather sunlight and turn it into electricity.



First, the electricity generated by your PV system is used by your family living in your home.

If there is any electricity left over, it's returned to the grid and you get credit.

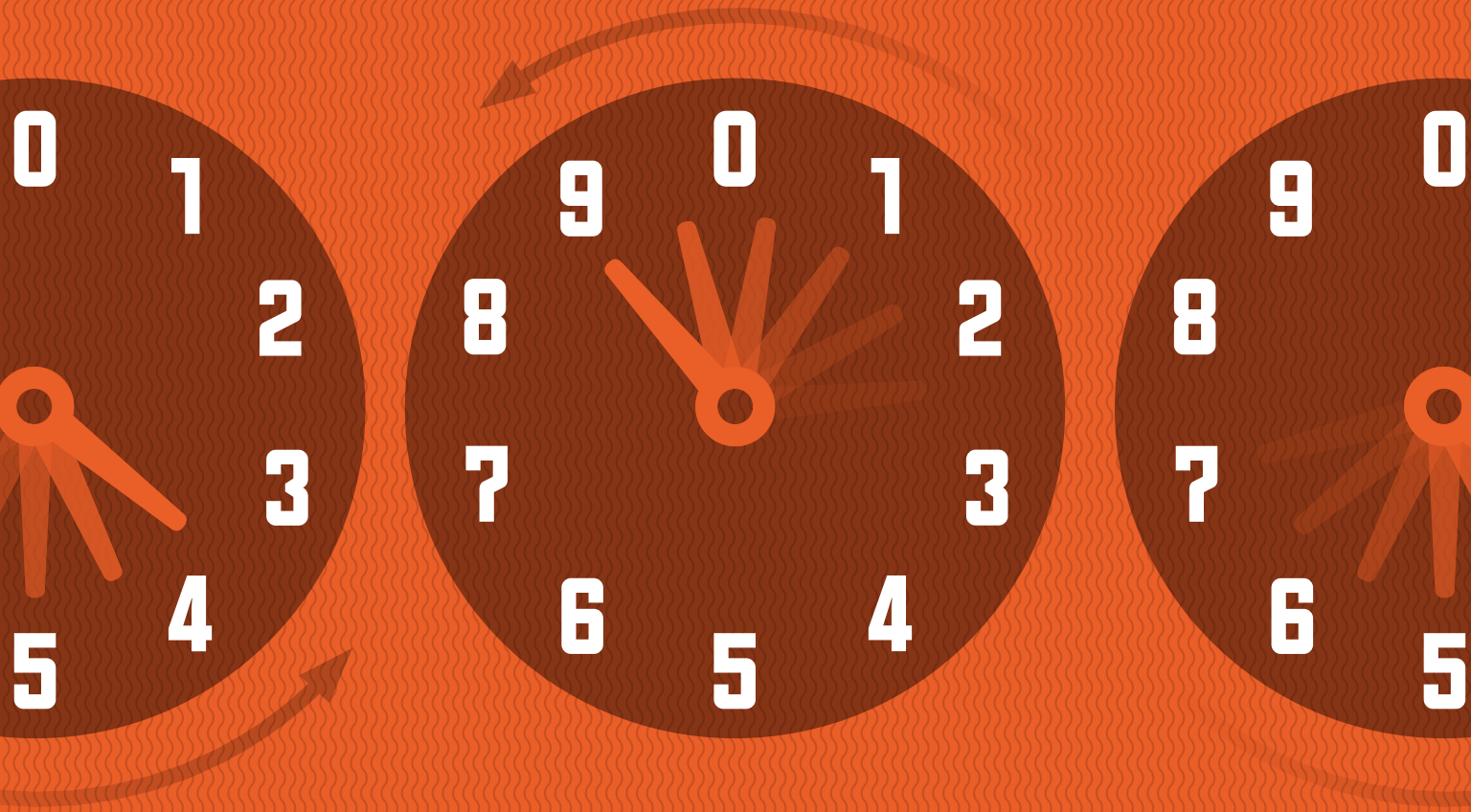
5 *Making Electricity. Using Electricity.*

Some days your PV system will make more electricity than you need. On those days, the extra electricity will go back into the Grid and you'll get credit for it.

Some days your PV system will make less electricity than you need. On those days, you will take electricity from the Grid and be charged for it.

The electricity your PV system makes will go first to power your house, then—if there is extra—it will be fed back into the Grid.

KILOWATTHOURS



Use less electricity than you're making and watch your meter run backwards!

6 *Net Metering*

Getting the electricity you need.

(And Getting Credit for the Electricity You Make)

IF YOU LIVE IN A SINGLE-FAMILY HOME

The utility companies have something called "Net Energy Metering." If you live in a single-family home, you'll sign up for this when your PV system is installed.

Net Energy Metering lets the electric company keep track of how much electricity you use and how much your PV system makes, so you can get credit for it.

On days your PV system makes more electricity than you need, your meter runs backwards and the extra electricity goes back to the grid. When this happens, the utility credits you for the full retail value of that electricity.

On days you need more electricity, the utility company provides you with the extra electricity you need.

This "give and take" between your PV system and the electric company is tracked for a year. At the end of the year, you receive a bill for the "net amount" of energy you used that year. Most utility companies allow you to receive a monthly bill if you prefer. Read more about this in the next section "How Your Bill Will Change."

IF YOU LIVE IN AN APARTMENT COMPLEX OR OTHER MULTI-FAMILY HOME

The utility companies have something called "Virtual Net Metering." If you live in an apartment or some other multi-unit home, you'll sign up for this when your PV system is installed.

When PV is put on an apartment complex, there's only one meter to keep track of how much electricity the system is producing. If you live in a single-family house with PV, it's obvious who gets credit for the electricity produced, but when you live in an apartment building, it's not so obvious.

Virtual Net Metering lets each apartment unit receive a percentage of the credit from the electricity produced, depending on how big the unit is. For example, a two bedroom unit would receive a higher credit than a one bedroom unit.

If there is a credit at the end of the month, it is rolled over to the next month. Electricity use and production is tracked over 12 months and at the end of the 12 month period, all credits are zeroed out.

7

How Your Electric Bill Will Change

Utility companies in California have different ways of charging for electricity, so we can't tell you here exactly how your bill will change.

But here are some things you should know:

- With PV, you will be charged a monthly fee between $4 and $14 per month. That fee covers services like maintaining the grid and coming to read your meter.
- Most utility companies track the electricity you make and use for one year, starting at the time your system is installed.
- At the end of that year, they bill you only for the "net" amount of electricity you used that year (that's why it's called "Net Metering"). That means:

  The dollar value of the electricity your system made that year

  – Minus –

  The dollar value of the electricity your household used that year

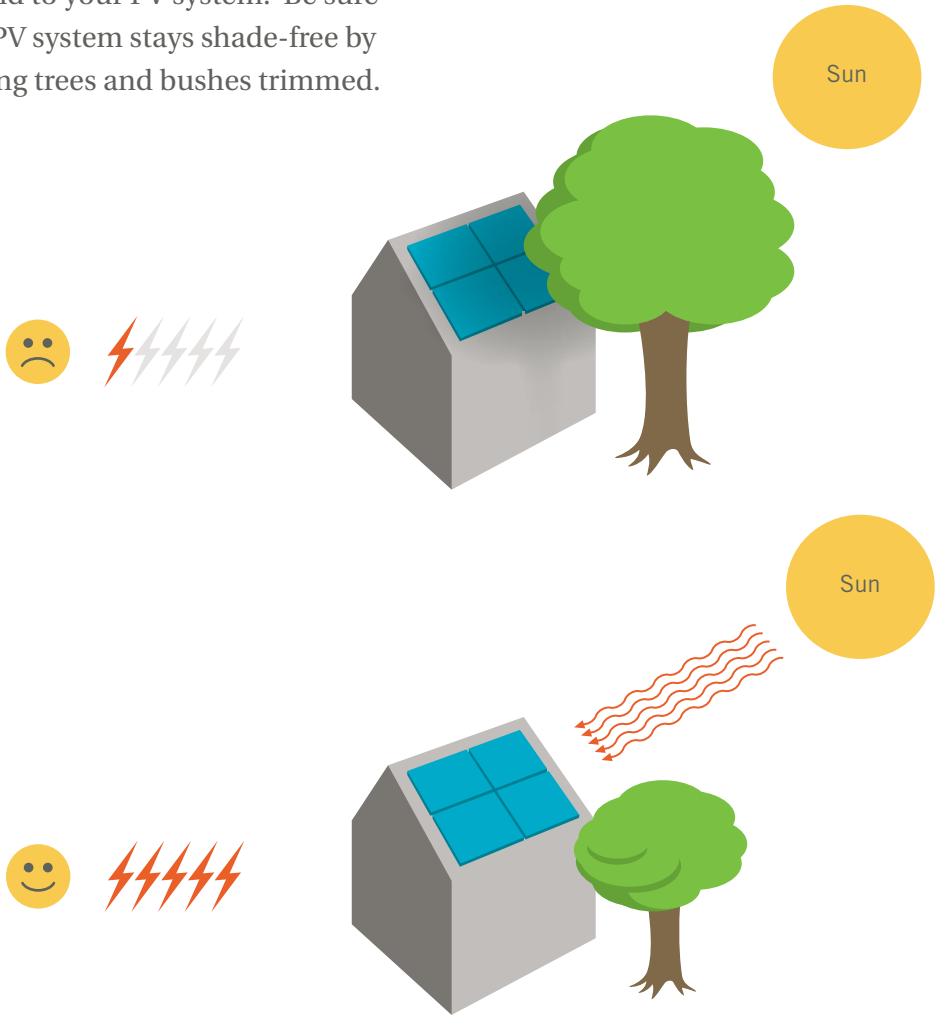
While the idea of not having a monthly electricity bill may be appealing, the idea of getting one bill at the end of the year is kind of scary. So, most companies offer some options, such as:

- Letting you continue to pay your bill each month for the amount you used that month.
- Averaging your bills throughout the year and charging you a flat rate each month.

You probably won't be able to reduce your electric bill down to zero, but you will be able to reduce your bill. How much depends on:

- The size of your PV system and how much electricity it generates.
- How much electricity you use each month.
- If your utility company changes how much it charges for electricity.

We all love trees, but trees are not a friend to your PV system. Be sure your PV system stays shade-free by keeping trees and bushes trimmed.



8 Maintenance

Your PV system needs very little maintenance. Because the panels have no moving parts, they are nearly carefree.

In most areas, an occasional rain will keep your PV panels clean. But, if you live in a place where it is very dusty, you may want to hose off your panels every few months. Likewise, if you live in a place where it snows, you should be sure your PV panels are free of snow cover.

Caution: Spraying cold water on hot solar panels can cause damage that cannot be repaired.

SHADE IS A PV PANELS BIGGEST ENEMY!

Be sure to trim any trees or large shrubs that may shade your PV panels. Anything that covers up or casts a shadow on your PV panels will keep them from producing the electricity they should.

DID YOU KNOW?

Heating and cooling costs account for about 50% of the home energy budget. An ideal way to cut back on energy use and reduce your utility bills, is to adjust your home's thermostat.

9 *Good Energy Habits*

Your new PV system can help you keep your electricity bill down.

There are two ways to make your PV system work better for you:

1) Increase the amount of electricity it makes.
   (that's hard to do because you can't make more sunshine)
2) Decrease the amount of electricity you use.
   (that's easier because you can reduce the amount of electricity you use)

FAMILY ONE

"Our new PV system is making electricity we can use. If we are careful we can save a lot of money!"

So family one replaced all their incandescent lightbulbs with Energy Star compact fluorescent lightbulbs, and they turned off the lights when they weren't needed.

Family one did laundry in the early morning or late evening and hung their clothes outside to dry. Family one got rid of that extra refrigerator in the garage.

Family one set their thermostat as low as they could in the winter and as high as they could in the summer.

Family one went to the Internet and searched: save energy at home, then they had fun seeing how many things they could do in their house to save electricity.

At the end of the month, Family One's electricity bill was $17.95

FAMILY TWO

"Our new PV system is making electricity we can use. Now our electricity will be free, so we can use more!"

So Family two bought more lights and kept them on all the time so they wouldn't miss anything.

Family two did laundry every day, even if there wasn't much laundry to do.

Family two bought a small refrigerator for the front room, so they wouldn't have to walk all the way to the kitchen when they wanted a soda.

Family two bought a big freezer for the garage, so they could store enough popsicles for the whole summer.

Family 2 bought a space heater and fan for every room in the house, so everyone would always be perfectly comfortable.

At the end of the month, Family Two's electricity bill was $287.69

This is a story about two families…

…who lived next door to each other.
Both families received new PV systems.

Two families.
Two approaches.
Two bills.
Which family will you be?

When you save electricity, you save money.

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